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We claim:

1. A set of marker genes comprising two or more genes identified in Table 1 as differentially expressed in primary tumors of recurring breast cancer patients exhibiting a outcome to anti-estrogen therapy, with a significance of p<0.05.

- 2. The set of marker genes of claim 1, comprising two or more genes of the 81-gene signature listed in Table 1.
- 3. The set of marker genes of claim 1, comprising two or more genes of the 44-gene signature listed in Table 1.
- 4. The set of marker genes of claim 1, comprising one or more genes selected from FN-1, CASP-2, THRAP-2, SIAH-2, DEME-6, TNC, and COX-6C.
- 5. The set of marker genes of claim 1, comprising one or more of TNC, SIAH-2, DEME-6, and COX-6C.
- 6. The set of marker genes of claim 1, comprising one or more of FN-1, CASP-2, THRAP-2, SIAH-2, and DEME-6.
- 7. The set of marker genes of claim 1, comprising one or more of DEME-6 and CASP2, and one or more of SIAH-2 and TNC.
- 8. The set of marker genes of claim 1, comprising the 44-gene signature listed in Table 1.
- 9. A nucleic acid probe comprising a marker gene as defined in any of claims 1-7, or a complementary polynucleotide thereof, or a fragment thereof comprising at least 10-50 contiguous nucleic acids.

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10. A nucleic acid probe comprising a complementary polynuclotide of the nucleic acid probe of claim 9.

- 11. An assay system for diagnosing patient response to anti-estrogen therapy for recurring breast cancer, comprising a set of marker genes or nucleic acid probe as defined in any of claims 1-10.
- 12. The assay system of claim11, wherein said marker genes are disposed on an assay surface.
- 13. The assay system of claim 11, wherein said nucleic acid probe is disposed on an assay surface.
- 14. The assay system of claim 11, wherein the assay surface comprises an assay chip, array, or fluidity card.
- 15. An assay system for diagnosing patient response to anti-estrogen therapy for recurring breast cancer, comprising binding ligands that specifically detect polypeptide encoded by each of the respective marker genes of any of claims 1-7.
- 16. The assay system of claim 15, wherein the binding ligands comprise an antibody or binding fragment thereof.
- 17. A method for predicting outcome of anti-estrogen therapy for recurring breast cancer, the method comprising:
 - a. analyzing a patient's primary tumor tissue for expression of a set of marker genes as defined in any of claims 1-7; and
 - b. correlating a Cluster 1 expression pattern of the marker genes in the primary tumor with a prediction of Progressive Disease; and

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c. correlating a Cluster 2 expression pattern of the marker genes in the primary tumor with a prediction of Objective Response to anti-estrogen therapy.

- 18. A method for predicting Progression Free Survival of anti-estrogen therapy for recurring breast cancer, the method comprising:
 - a. analyzing a patient's primary tumor tissue for expression of a set of marker genes as defined in any of claims 1-7; and
 - b. correlating a Cluster 1 expression pattern of the marker genes in the primary tumor with a prediction of lack of progression free survival; and
 - c. correlating a Cluster 2 expression pattern of the marker genes in the primary tumor with a prediction of positive progressin free survial.